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ABSTRACT

Students enrolled in two sections of college algebra (Math 110) at the University of Maryland in spring 1984 were informed about assistance available from the Math Lab. They were also informed that a sticker would be attached to any one of the four semester exams when grades indicated that the student should pursue one or more of the Lab services. Two other sections were not informed about the Lab nor given stickers. Twenty-five students received stickers. There were significantly fewer grades of D, F, or W earned in the course among the treatment group than among the comparison group. Further, while there were no differences between the two groups on persistence rates, the rates of students persisting in good standing were higher for the treatment group, and their semester grade point averages were significantly higher for two years after the intervention. However, only two students appeared in the Lab as a result of having received a sticker on an exam. Perhaps students who received stickers sought help elsewhere, from tutors or peers, or were more diligent. (Author/MNS)

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MATH 110 STICKER CAPER:

A RETENTION INTERVENTION

Research Report # 12-88

The Counseling Center Retention Study Group*

* Vivian Boyd, Steven Carstens, Patricia Hunt, Stanley Hunt, Brian McLaren, Thomas Magoon

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COUNSELING CENTER
UNIVERSITY OF MARYLAND
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Computer time for this project has ben provided in full through
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Math 110 Sticker Caper: A Retention Intervention

The Counseling Center Retention Study Group*
The University of Maryland College Park

Research Report # 12-88

Summary

Forty-nine students enrolled in designated sections of a required college alegbra course were taken to the Reading and Study Skills Lab for their second class period, during which time math skills assistance available at the Lab were described and demonstrated. Students were informed that a sticker which read THIS GRADE MAY BE DUE TO WEAKNESS IN BASIC MATH SKILLS. I URGE YOU TO CALL 454-2935 OR GO TO 2201 SHOEMAKER FOR HELP would be attached to any of the four semester exams whose grades were below a certain cutoff, thereby indicating the student should pursue one or more of the math skills services at the Lab. Fifty-one students in either of two comparable sections of the course served as a comparison group. For the semester prior to intervention, there were no statistically significant differences between the treatment group and the comparison group in grade point average.

A total of 25 students received exams with stickers affixed. There were significantly fewer grades of D, F, or W earned in the course among the treatment group than among the comparison group. Further, while there were no differences between the two groups on persistence rates, compared to the comparison group the rates of students persisting in good standing were higher for the treatment group, and their semester grade point averages were significantly higher for two years after the intervention.

However, only two students appeared in the Lab as a result of having received a sticker on an exam. Perhaps students who received stickers sought help elsewhere, from tutors or peers, or were more diligent. These hypotheses remain to be tested.

MATH 110 STICKER CAPER

The Counseling Center Retention Study Group*

University of Maryland, College Park, Maryland

The number of students who leave the University of Maryland at College Park for reasons other than graduation is high, as it is at comparable state universities. Some of the students who leave UMCP before graduation do so because their educational goals can not be met here and they transfer elsewhere. Some leave because it is their perception that the University is not responsive to their educational, developmental, financial, personal, or social needs. As higher education becomes increasingly more universal, its institutions must become increasingly responsive to the diverse needs of its student consumers.

The Retention Study Group at the University of Maryland is a group of Counseling Center faculty and staff concerned about the issues of attrition and retention of students. It believes that the University has an obligation to provide support services for every student admitted into a degree program here, and that, in turn, the student has an obligation to make use of support services once the need has become apparent. The Retention Study Group therefore has as its mission the development, implementation, and evaluation of pragmatic, manageable, economical, diverse interventions targeted at small samples of

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students considered at high risk of attrition. Interventions which have a proven impact on retention can then be implemented on a larger scale.

Part of the general education requirement at UMCP is the successful completion of three credits of mathematics (Math 110: Introduction to Mathematics I; or Math 115: Precalculus, for science/technology majors) by the time the student has earned 60 credit hours, if matriculation occurred on or after May 1980. Exemption from this general education requirement is granted to students who score above a prescribed cutoff on the SAT-M, the CBAT-M, the APEC, or the CLEP-M.

Many students have difficulty meeting this requirement. In the Fall semester of 1983, for example, 52% of the students who registered for Math 110 earned a grade of D, F, or W; in Spring 1984 the rate was 53%; in Fall 1984, it was 40%. These rates are a clear indication of the importance of giving attention to student persistence and achievement in Math 110, particularly in light of the gatekeeping role of Math 110 in the UMCP general education requirement.

Studies of the motivational effects of giving feedback to college students concerning their test performance have had mixed results, leading to a tentative conclusion that comments intended to motivate students appear to be effective in at least some situations (Bloom & Bourdon, 1980; Stewart & White, 1976). While feedback seems effective in the field of English, not much has been published on motivational feedback in the field of mathematics (Dykes, 1985). The present study was designed to discover the effects of motivational feedback on students

enrolled in a college algebra course.

METHOD

Students enrolled in either of two designated sections of Math 110 in Spring 1984 (total n = 49) were taken to the Reading and Study Skills Lab for their second class period. During that class period a Lab math skills counselor described and demonstrated math skills assistance available from the Lab. The Teaching Assistants responsible for the two sections informed their students that a sticker would be attached to any of the four semester exams whose grades indicated the student should pursue one or more of the math skills services at the Lab. The sticker would read THIS GRADE MAY BE DUE TO WEAKNESS IN BASIC MATH SKILLS. I URGE YOU TO CALL 454-2935 OR GO TO 2201 SHOEMAKER FOR HELP.

Students in either of two comparable sections of Math 110 (total n = 51) had no class visit to the Lab and received no feedback stickers on their exams, but received the usual exam feedback of a grade. These sections served as a comparison group.

Outcome Variables

In addition to the final MAth 110 grades of students in the experimental and comparison groups, there were three other outcome variables studied to determine the effect of the intervention on subject retention rates:

(1) academic persistence, defined as registered for and completed a given semester;

(2) persistence in good standing, defined as registered for and completed a given semester and with no academic action

taken as a result of that semester;

(3) semester grade point average, as determined by the University three weeks after the end of the given semester.

RESULTS

Twenty-two students (47%) received no sticker on any of the four semester exams; 13 students (28%) received one sticker; 10 (21%) received two stickers; and 2 (4%) received three stickers.

There were significantly fewer grades of D, F, or W earned among the treatment group than among the comparison group, as can be seen in Table 1.

Table 1.

Math 110 Final Grade by Group

	Group			
	Experimental		Control	
Final Grade	n	%	n	%
A	7	15	1	2
B	17	36	5	10
C	4	9	12	24
D	4	9	10	20
F	6	13	11	22
W	9	19	11	22

chi square = 19.21
$p < .05$

For the semester prior to treatment, there were no statistically significant differences (at the .05 level) between the treatment group and the control group on the three outcome variables.

Comparison of academic persistence rates for the treatment and comparison groups showed no differences for the semester of intervention or for four subsequent semesters (see Table 2).

Table 2.

Academic Persistence Rates by Group

	Group			
	Experimental		Control	
Semester	n	%	n	%
Spring '84(a)	47	100	51	100
Fall '84	39	80	46	84
Spring '85	36	74	40	73
Fall '85	34	69	39	71
Spring '86	34	69	38	69

(a) semester of intervention

The rates of those who persisted in good standing were higher for the experimental group than for the control group, significantly so one year after the intervention, as can be seen in Table 3.

Table 3.

Rates of 'Registered and in Good Standing' by Group

	Group				
	Experimental		Control		
Semester	n	%	n	%	p
Spring '84(a)	36	77	36	71	
Fall '84	34	85	30	68	.15
Spring '85	33	97	29	81	.07
Fall '85	31	63	30	55	
Spring '86	26	53	25	46	

(a) semester of intervention

Looking at semester GPA, there were significant differences between the two groups both for the semester of intervention and for two semesters after intervention, as can be seen in Table 4.

Table 4.

Semester Grade Point Average by Group

	Group				
	Experimental		Control		
Semester	M	S.D.	M	S.D.	p
Spring '84(a)	2.57	.89	2.02	.74	.001
Fall '84	2.75	.88	2.02	.90	.0005
Spring '85	2.66	.64	2.33	.71	.05
Fall '85	2.73	.80	2.54	.77	
Spring '86	2.72	.93	2.41	.85	

(a) semester of intervention

DISCUSSION

There seem to be statistically significant differences in academic performance for the treatment group as opposed to the comparison group, both in final grade for Math 110, and for grades in general. What is curious is that the math skills counselor in the Lab reported that just two students appeared in the Lab as a result of having received a sticker on a math exam. Perhaps those who received the feedback sticker sought help elsewhere, from tutors or peers, or were more diligent in studying.

More generally, perhaps having spent one class period on site in the Lab exposed students to the location of and resources available at the Lab, which increased their expectations of being able to seek assistance when in academic difficulty, and they later returned to take advantage of the resources offered; hence their better grade point average. These hypotheses remain to be tested. The intervention of giving feedback in the form of stickers on tests below a designated cutoff appears beneficial to

students registered for Math 110, and is cost-effective as well. The study should be repeated with two experimental conditions: one with a class visit to the Lab and one without a class visit to the Lab, and with both sections receiving the feedback stickers when appropriate.

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